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State Geological Survey Libraries: A Disparity in Resources, Services, Access, and Professionalism

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This study is a census of the libraries of the fifty state geological surveys and their unique collections of geological survey reports and bulletins, field trip guidebooks, topographic maps, field notebooks, and theses and dissertations. Respondents were queried about their locations, administrative bodies, funding sources, collections, users, services, and staff. Libraries can be divided into two groups: those administered by an individual state geological survey and those administered by a university library. While a handful of the survey-administered libraries have sizeable collections and offer a wide range of services, most lack resources for collection development, services, and staff. University-administered libraries benefit from being a part of a larger university library system with a variety of services.

KEYWORDS *geological survey libraries, geological surveys, geology libraries*

INTRODUCTION

The mission of a state geological survey is to oversee a state's geologic resources. These state agencies conduct research and provide scientific information on a state's geologic, mineral, ground water, and energy resources. They provide professionals and the public with information on earthquakes, volcanoes, faults, caves, and abandoned mines that can have significant academic and economic value. While the larger U.S. Geological

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Survey is more well known, the surveys of the fifty states also serve an important purpose. Some state geological surveys have been in existence since the early 1800s and are among the oldest of state government agencies. The libraries or collections that serve state geological surveys house their unique and valuable collections of survey reports, bulletins, and circulars, as well as topographic maps, field trip guidebooks, aerial photos, field notebooks, and theses and dissertations on a state's geology. These collections can serve the staff of the survey as well as university researchers and students, professional geologists, and the general public. A telephone census was conducted to determine the state of these fifty collections—their administration, budgets, locations, collections, services, users, and staffs.

LITERATURE REVIEW

Several articles have been written on individual libraries of state geological surveys, but no study has been conducted on the libraries as a group. The proceedings of the Geoscience Information Society have provided a venue for much of the research conducted on individual state geological survey libraries. Sorensen has been a prolific author on a specific state geological survey library. Sorensen's (1987) article focuses on the Kansas Geological Survey's (KGS) recognition of the need to coordinate the management of technical information relating to Kansas geology with the development of a database index/catalog of data and physical files collected by the Survey. Sorensen (1989) wrote about the integration of library and archival holdings to benefit scientific research. The topic of her 1991 article (Sorensen and Buchanan 1991) was how to reference and archive digitally produced maps. The role the KGS library played in initiating the development of an in-house database for storing and retrieving bibliographic data on geological studies in Kansas is profiled in her 1993 article (Sorensen and Deputy 1993). Sorensen's (1999) article on dissemination of information at the Kansas Geological Survey highlights the role the survey library plays in collecting, managing, and distributing open-file documents, which provide the dissemination of information that must be released immediately to fill a public need. Sorensen and Adkins-Heljeson (2004) focused on the library's role in making out-of-print publications on Kansas geology available to the public in electronic format.

Manson's research focused on the library of the Washington Division of Geology and Earth Resources, the state's geological survey. Manson (1994) gave a brief overview of the contributions a survey library can make in aiding planners to classify and designate mineral resource lands and geologically hazardous areas. Manson (2000) raised questions about the

impact of electronic publishing on a small library's archiving electronic information. Manson (2001) looks at the evolution of a state geological survey library from the typewriter to the computer. While this article discusses the situation in Washington specifically, it can be applied to other state geological survey libraries. Manson (2003), however, is a case study of the Washington survey library and the steps taken to prevent the closure of the library when a serious state budget shortfall occurred. The article includes a detailed fact sheet that was distributed about the library's collections, services, and users, as well as a survey, whose results were used to bolster support for the library. A later article by Manson (2005) did not specifically look at survey libraries but rather focused on state survey publications and their indexing in GeoRef, the primary electronic database of geological literature.

Brown (1979) and Cussins (1982) wrote articles in their state library association journals on the Mississippi and Missouri geological survey libraries. More recently, a master's thesis by Hodkinson (2007) at the University of North Carolina created a plan of action for improving the library at the Virginia Division of Mineral Resources, Virginia's state geological survey. As part of the study, Hodkinson solicited the advice of librarians at other state geological surveys regarding their collections.

Three histories have been written on state geological surveys, but little information is included about their libraries. In 1911 a U.S. Geological Survey Bulletin, compiled by C. W. Hayes (1911), collected information regarding the various state surveys. In this publication, some states make brief mention of their libraries. It is usually, however, in the context of the state law establishing the survey, including the library, or in reference to the survey's and the library's appropriation or budget. Socolow (1988) compiled histories of the fifty state surveys. Each state survey submitted a historical summary, but few mentioned their libraries. Cobb (2008), the director of the Kentucky Geological Survey, wrote a centennial history of the Association of American State Geologists, the organization of state geological survey directors. The 500-page volume discusses the accomplishments of state geological surveys during the past one hundred years, but there was no mention of the role their libraries played.

METHODOLOGY

With a total pool of only fifty geological surveys, the goal of the study was to conduct a census of all state surveys. To determine the person responsible for the survey's library, names were obtained either from the state geological survey's Web site or from a telephone call to each state geological survey administrative office. Some challenges occurred in determining the appropriate person to participate in the telephone survey. Some individuals whose

names were provided didn't consider themselves responsible for their libraries. Others had responsibilities far beyond the libraries. After the list was compiled, the designated individuals were contacted by telephone and asked to participate in a survey about their library. A telephone survey was chosen over an online survey with the hope of eliciting a high response rate from the small pool. The term *library* was defined to respondents as the collection or information resources serving or accessible to the state geological survey. The respondents of the telephone survey included professional librarians, clerical staff, geologists, and directors of state geological surveys.

A 22-question telephone survey was administered in summer 2008. Eighteen of the survey questions had multiple-choice answers; four questions were open-ended to allow for individual comments.

Contact was made with representatives of all fifty state geological surveys or their equivalents. Three of the fifty state geological surveys were not included in the reported data: Hawaii no longer had a state geological survey, New York's survey was absorbed by the New York State Museum, and North Carolina's geological survey staff utilized the services of the North Carolina Department of Environment and Natural Resources library. Thus, results are reported for forty-seven libraries. State surveys usually have a well or core sample library. These libraries, which preserve and house samples from the state's geologic structures, were not a part of this study.

RESULTS

The libraries or collections that serve the state geological surveys come in various shapes and sizes. Their administration, their funding source, and even their location affect their usage, their services, their collections, and their future. The forty-seven collections reported in these findings can be divided into two broad groups: those that are administered by a state geological survey (survey-administered) and those that are part of a university library system (university-administered). Seventy-nine percent of the libraries (thirty-seven libraries) are administered by state geological surveys; the remaining 21 percent (10 libraries) are administered by university library systems (Table 1). Forty percent of the forty-seven libraries are located on university campuses, while 60 percent are housed in a state geological survey agency in a state government office building, usually in the state capital.

Table 2 shows that more than one half of the libraries receive their funding from a state geological survey. Less than one-quarter receive their funding from a university library system. Interestingly, 15 percent of the libraries receive no funding at all. Fifteen percent of the forty-seven libraries (Table 3) are not open to the public, a somewhat surprising finding given that geological surveys are state government agencies. Another 13 percent are open to the public with limitations—by appointment, with supervision,

TABLE 1 Administration of State Geological Survey Libraries (N = 47)

	Survey-administered	University-administered
Alabama	x	
Alaska	x	
Arizona	x	
Arkansas	x	
California	x	
Colorado	x	
Connecticut	x	
Delaware		x
Florida	x	
Georgia	x	
Hawaii*		
Idaho	x	
Illinois	x	
Indiana		x
Iowa		x
Kansas	x	
Kentucky		x
Louisiana		x
Maine	x	
Maryland	x	
Massachusetts		x
Michigan	x	
Minnesota	x	
Mississippi	x	
Missouri	x	
Montana		x
Nebraska	x	
Nevada		x
New Hampshire	x	
New Jersey	x	
New Mexico	x	
New York**		
North Carolina***		
North Dakota	x	
Ohio	x	
Oklahoma		x
Oregon	x	
Pennsylvania	x	
Rhode Island	x	
South Carolina	x	
South Dakota		x
Tennessee	x	
Texas	x	
Utah	x	
Vermont	x	
Virginia	x	
Washington	x	
West Virginia	x	
Wisconsin	x	
Wyoming	x	
Total	37	10

*Hawaii no longer has a state geological survey.

**New York's state geological survey was absorbed by the New York State Museum.

***North Carolina's geological survey staff uses the North Carolina Department of Environment and Natural Resources Library.

TABLE 2 Budget Source of State Geological Survey Libraries (N = 47)

Receives funding from state geological survey	26 (55%)
Receives funding from university library system	10 (21%)
Receives no funding	7 (15%)
Receives funding from another state government agency	3 (6%)
Receives grant money	1 (2%)
Total	47 (99%)

TABLE 3 Survey Library Is Open to the Public

	Survey- Administered Libraries (N = 37)	University- Administered Libraries(N = 10)	Total Libraries (N = 47)
Open to the public with no restrictions	24 (65%)	10 (100%)	34 (72%)
Open to the public with restrictions (by appointment, etc.)	6 (16%)	0	6 (13%)
Not open to the public	7 (19%)	0	7 (15%)
Total	37 (100%)	10 (100%)	47 (100%)

or on selected days of the week. Thus, 28 percent of the libraries either are not open or have limited availability to the public. All of these libraries are administered by state geological surveys. All of the university-administered collections are open to the public.

Table 4 shows the highly specialized clientele of these libraries. More than two-thirds of libraries reported that most of their patrons are geological survey staff. Only a small group of libraries (4 percent) said that more than half of their users are from the general public.

Personnel for these libraries vary as widely as their funding and usage. Only 34 percent of respondents said the library is staffed by an individual with a graduate degree in library or information science. Thirty percent of the libraries are staffed by clerical staff. Professional geologists staff 15 percent of the libraries, among their other responsibilities. Nearly one-fourth of the collections (23 percent) are not staffed at all.

The difference in the size of the collections among the forty-seven libraries is great, from the smallest collection of 250 volumes to the largest

TABLE 4 Users of Survey-Administered and University-Administered Libraries

	Survey- Administered Libraries (N = 37)	University- Administered Libraries(N = 10)	Total Libraries (N = 47)
50% or more of users are survey staff	32 (86%)	0	32 (68%)
50% or more of users are university faculty, staff, or students	1 (3%)	10 (100%)	11 (23%)
50% or more of users are general public	2 (5%)	0	2 (4%)

of more than 150,000 volumes. The larger collections hold research reports, bulletins, and circulars from their respective state geological surveys as well as similar publications from other state geological surveys. Many also hold publications from international geological surveys. Other materials that make up these collections include field trip guidebooks, theses and dissertations, topographic maps, aerial photos, and field notebooks. It is these materials that make the survey libraries unique and valuable. Field trip guidebooks provide a synopsis of an area's geology, including a detailed road log of a field trip. Guidebooks are not usually sold in bookstores and are not widely distributed. As Manson (1994) observed, "Some of these documents are considered to be 'gray' literature, and traditional libraries find them difficult to deal with and many choose not to include them in collections."

The impact of the Internet has been felt in different ways by the forty-seven libraries. Nearly one-third of respondents to the survey said the Internet in some way had a negative impact on their library. Most of them said its greatest impact was on the reduction in the number of walk-in patrons to the library. One survey respondent said that too many people think everything is on the Internet and that this provides a mind-set that can make it difficult to obtain funding for the library. As state geological surveys make their published research in bulletins, circulars, and reports available in full-text via their Web sites, patrons now "come in the door virtually," as one respondent said.

Meanwhile, some collections are thriving by taking full advantage of the Internet. Some have a link on the survey's main Web site to provide visibility for the library. Some make their library holdings available online. More than one respondent said the Web has made people more aware of their library's existence. One survey-administered library responded that the Internet has facilitated cooperative agreements with university libraries to share resources.

One noticeable difference in geological surveys in recent years is the demise of the long-standing exchange program among the fifty state surveys. The exchange program allowed surveys to share their reports, bulletins, circulars, and field trip guidebooks with other state surveys. Many surveys exchanged publications with international geological surveys as well. Survey library collections grew as these publications were added to their shelves. Kidd (2007) said in describing the role the Oklahoma Geological Survey (OGS) played in the development of the Youngblood Energy (Geology) Library at the University of Oklahoma, "The quality and the size of the collection are in large measure a result of the OGS contributions." Today, many state surveys are no longer producing print publications but instead are making them available in full-text on the survey's Web site. Most respondents said that their participation in the exchange program has changed substantially in the past decade. They are either exchanging publications

with contiguous or neighboring states only or are not exchanging publications at all, relying instead on electronic access to publications on other state geological survey Web sites.

Survey-Administered Libraries

Thirty-seven of the forty-seven libraries are administered by state geological surveys. These thirty-seven libraries have great variety among them regarding collection size, staffing, users, and hours of operation. A few are flourishing, while the majority is struggling to provide services. Nine of them warrant special mentioning because they have a critical mass of resources and services comparable to other specialized government libraries. These libraries are located in California, Florida, Illinois, Kansas, New Mexico, Pennsylvania, Texas, Utah, and Washington. For the following reasons they stand apart:

1. They are open to the public and maintain regular hours.
2. They provide a full range of services to users. Reference assistance is provided not only to survey staff but to university faculty, staff, and students, professional geologists, and the general public. Reference services are provided for patrons in person, by telephone, by mail, and by e-mail.
3. The collections of seven of the nine libraries are cataloged using either Library of Congress or Dewey Decimal Classification System.
4. Five of the libraries make their holdings accessible online.
5. Photocopying, printing, and scanning are available to patrons.
6. Participation in interlibrary loan takes place.
7. The libraries have sizeable collections of monographs and all but one of the libraries maintain active subscriptions to journals.
8. Six employ a professional librarian; staff with more than twenty-five years' experience supervise two of the libraries; a long-term geologist supervises the other.
9. Seven of the nine librarians/staff/geologists (78 percent) belong to the Geonet Listserv, a listserv sponsored by the Geoscience Information Society that facilitates the exchange of information in the geosciences among scientists, librarians, editors, cartographers, and educators.
10. Seven of the nine libraries (78 percent) have links from the first page of their state's geological survey Web site, which provides easy visibility and access to the library and its collection. The Web site of the Washington Geology and Earth Resources Division (the state's geological survey), for example, proudly states, "The Washington Geology Library is the largest collection of materials on Washington geology in the world."

The other twenty-eight survey-administered libraries have small collections with little or no resources for maintaining the collection or adding new materials. One collection was described as occupying a few file cabinets.

The lack of staff devoted to the maintenance of these libraries is a critical issue. It affects the services the library can provide, even if and when the library is open to the public. Thirty-nine percent of these libraries are not staffed. One survey respondent said, “We haven’t had a librarian in thirty years.” Another said, “We used to have a librarian, but now the library isn’t staffed at all.” Some of these libraries, with no funding for materials or staff, are struggling to survive.

University-Administered Libraries

The ten university-administered libraries stand in sharp contrast to the majority of the thirty-seven survey-administered libraries. The ten collections are part of a university library and enjoy the advantages of this relationship, including a long-term, guaranteed financial commitment from a larger university library system. In six of the state surveys (Delaware, Kentucky, Louisiana, Massachusetts, Montana, and South Dakota), the main university library serves as the library for the state geological survey; the survey has no separate or individual library. In four states (Indiana, Iowa, Nevada, and Oklahoma), a closer relationship exists between the university library and the geological survey. For these states a branch geology library of the university library system serves as the survey’s library and is located in the same building (or in close proximity) to the state geological survey and the geology academic department. Bringing together in close proximity all three entities, the library, the state geological survey, and the geology department allows for a close relationship among the three. These four libraries serve a dual purpose as a university branch geology library as well as the library for their respective state geological surveys. The respondents from these four university geology libraries unanimously agreed that they were the state’s geological survey library.

University-administered libraries enjoy the benefits of being associated with university library systems where collection development, acquisitions, cataloging, and interlibrary loan are coordinated efforts. The ten university-administered libraries are open to the public and maintain regular hours. They offer all of the services the survey-administered libraries do and more. Library instruction to geology classes at the university is a key part of the mission of these libraries. Some offer more advanced reference services, such as chat. All have large collections to support the curriculum of the geology academic department on campus. Nine of the 10 university collections have a professional librarian who serves as the bibliographer for geology. One of these respondents described herself as a “liaison” to the state geological survey. Some of these librarians also have other subject responsibilities (usually in the sciences) and don’t devote 100 percent of their efforts to geology. All ten libraries offer circulation privileges to the survey staff. Survey staff on some of the campuses have university identification cards,

while other survey staff use borrower's permits or community cards for circulation. None of the geological surveys in these ten states has a link from the front page of their Web site to the university library that serves them. Only four personnel from these ten libraries participate in the Geonet listserv.

CONCLUSION

Geological survey libraries have served the information needs of geologists, academics, and the public since the early 1800s. These collections of domestic and international geological survey research reports, topographic maps, field trip guidebooks, aerial photos, and field notebooks are unique, valuable, and worth preserving. Yet, by the beginning of the 21st century, the division of "haves" and "have nots" among survey libraries was pronounced. Libraries with adequate resources and access thrived while those without were functioning partially or not at all. The Internet has accelerated these differences. Among the forty-seven libraries surveyed, there is a disparity in collections, personnel, online resources, and access for the public. Those collections that are administered by university library systems are growing and benefit from their location and association. While a handful of the libraries administered by individual state geological surveys are flourishing with robust collections, a range of services for patrons, access to electronic resources, and a professional staff, the majority of the survey-administered libraries are struggling with small collections and little or no resources for materials or staff. Their viability is in question.

Decision points are approaching regarding whether these collections remain in their current state, whether new resources can be added, or whether the collection and its patrons will be better served by merging with another library. Many of these decisions will be influenced by the importance of the energy industry to the economy of a particular state. Those priorities can change according to the price of natural resources. For example, when a barrel of oil reached \$140 per gallon, areas never explored became economically viable for exploration and alternative forms of energy became profitable. Likewise, a forgotten collection of geological materials might rise in importance.

For the smaller survey-administered libraries to remain viable, the administration of these surveys would need to make their collections a higher priority. Designating a staff member to be responsible for the library would be an important first step. It was a mystery in some libraries as to who was in charge. Other steps would be developing procedures for inventorying the existing collection, devising a catalog or database of the library's holdings, setting up a circulation system, acquiring new materials, digitizing the collection, and creating a library Web site.

For small libraries whose administrations cannot provide this commitment, merging the survey's collection with a university library, as some surveys have done in recent years, is an option. A commitment from a university library system of funds to maintain the collection and staff to support it would provide assurance that the unique and valuable resources of these collections are available. Survey staff would lose the benefit of having a collection in close proximity but may gain more in the long run.

The ten collections that are a part of a university library system thrive because they enjoy the benefits and perquisites of being part of a larger body. Certainly the university-administered survey library is used differently. Survey staff could benefit from having access to large academic collections that support the curriculum of a geology degree program. While the geology librarian/bibliographer may not always be available because of other subject responsibilities, access to a larger collection may outweigh this disadvantage. Because not all of the university librarians enjoy the close proximity and close relationship that the nine thriving survey-administered librarians do, improving outreach to the geological survey staff and forging partnerships with the survey could be goals worth exploring.

State geological surveys might consider providing a link on their Web sites to their library collection, whether it is housed in a survey-administered or a university-administered library. Many of the surveys that are served by university libraries have no link from the survey Web page to the university library. Participation in the Geonet listserv by those who have responsibility for survey libraries was modest even though they would seem to have the most to gain from this association. A higher level of participation would benefit not only them but the geosciences field as well.

This census also offers insight into how external groups view the library profession. That only one-third of the state geological surveys employed a professional librarian to oversee their collections reinforced the notion that specialized libraries and library professionals are not synonymous. While some professionals seem to be mandatory in running a governmental organization (accountants, lawyers, etc.), among geologists, hiring a professional librarian remains an option.

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APPENDIX: SURVEY

Interview Questions—Coding Sheet

_____ Geological Survey

(State Name)

Libraries Serving State Geological Surveys

(The term “library” is defined as the collection or information resources serving or accessible to the state geological survey.)

1. Where is the library located?
 - a. In the building housing the state geological survey
 - b. In a university library building
 - c. On a university campus but not within an academic library
 - d. Other _____
2. Which of the following has administrative responsibility over the library?
 - a. The state geological survey
 - b. Another state government agency
 - c. A university library
 - d. Another academic institution
 - e. Other _____
3. From which of the following does the library receive funding? (Circle all that apply.)
 - a. The state geological survey
 - b. Another state government agency
 - c. A university library
 - d. Another academic institution
 - e. Other _____
4. How is the library used by patrons? (Circle all that apply.)
 - a. Place of study/research
 - b. Reference assistance
 - c. Check out materials
 - d. Place for Internet access
 - e. Use the library’s resources remotely via Internet
 - f. Other _____
5. What services are offered to your patrons? (Circle all that apply.)
 - a. Reference/research assistance
 - i. In person
 - ii. By telephone
 - iii. By mail
 - iv. By e-mail

- v. By chat
 - b. Interlibrary loan or document delivery
 - c. Formal library instruction
 - d. Self-service photocopying, printing, digitizing
 - e. Other _____
- 6. Is the library open to the public?
 - a. Yes
 - b. No
 - c. Other (Please explain) _____
- 7. Who can check out library materials? (Circle all that apply.)
 - a. State geological survey geologists and staff
 - b. Other state government employees
 - c. University faculty
 - d. University staff
 - e. University students
 - f. Professional geologists
 - g. General public
 - h. Library materials do not circulate
- 8. The library's collection is cataloged using:
 - a. Library of Congress classification system
 - b. Dewey Decimal classification system
 - c. Su-Doc
 - d. In-house system
 - e. Other _____
- 9. The library's catalog is:
 - a. Online
 - b. Card catalog
 - c. Both are in use
 - d. No catalog
- 10. Does the library participate in (receive publications from) an exchange program with
 - a. Other U.S. state geological surveys?
 - i. Yes
 - ii. No
 - b. Foreign geological surveys?
 - i. Yes
 - ii. No
- 11. In your experience, how has the exchange program changed in the library in the past five years?
- 12. Does the library have responsibility for depositing the state geological survey's publications with other organizations?
 - a. Yes
 - b. No
 - c. Other (Please explain.) _____

13. Is the library staffed by a professional librarian (with a graduate degree in library/information science)?
- Yes (how many)
 - Full time _____
 - Part time _____
 - No
14. How many staff (nonprofessional librarians) work in the library?
- Full-time staff _____
 - Part-time staff _____
 - Students _____
 - Volunteers _____
15. Who is your immediate supervisor?
- A state geological survey employee
 - Another state government employee
 - A university library employee
 - Another academic institution employee
 - Other _____
16. How many years have you worked in the library that serves the state geological survey?
- Less than 1 year
 - 1–3 years
 - 4–6 years
 - 7–9 years
 - 10–12 years
 - 13–15 years
 - More than 15 years
17. Do you participate in the Geonet listserv maintained by the Geoscience Information Society (GSIS), an organization that facilitates the exchange of information in the geosciences through cooperation among scientists, librarians, editors, cartographers, educators, and information professionals?
- Yes
 - No
18. Who are the users of the library? (Please give estimated percentages for each patron category.)
- State geological survey geologists and staff
 - Other state government employees
 - University faculty
 - University staff
 - University students
 - Professional geologists
 - General public
 - Other _____

19. What is the size of the collection? (Estimates are acceptable.)
- a. Monographs _____
 - b. Serial Subscriptions _____
 - i. Print journals
 - ii. Electronic journals _____
 - c. Electronic databases _____
 - i. List the primary database(s) used _____
 - d. Maps _____
 - e. Theses _____
 - f. Dissertations _____
 - g. CD-ROMs _____
 - h. DVDs _____
 - i. Microfilm _____
 - j. Microfiche _____
 - k. Other _____
20. How is the Internet changing the library and its services?
21. What are the biggest challenges facing state geological survey libraries or collections?
22. How can the state geological survey library better serve its patrons?
- Other Comments: